SN78Rxxx

Low Dropout Voltage Regulator (1.0A Series)

KODENSHI AUK

Semiconductor

http:// www.auk.co.kr

TO-252-5L

TO-220F-4SL

ORDERING INFORMATION

Product	Marking	Package
SN78RxxD	SN78Rxx	TO-252-5L
SN78RxxPIC	SN78Rxx	TO-220F-4SL

▲ Marking Detail Information

[TO-220F-4SL PKG Marking]

AUK(①)
G△YWW (②)
SN78Rxxx (③)

① AUK Logo

② Grade & M Code & Year & Week Code

③ Device Code

[TO-252-5L PKG Marking]

SN78Rxxx (①)
G△YWW (②)

① Device Code

② Grade & M Code & Year & Week Code

Description

The SN78Rxx is an efficient linear low dropout voltage regulator for various electronic equipment. It is designed to provide very low dropout voltage, and better than 2.5% output voltage accuracy.

And the SN78Rxx has various key features such as current limiting, over temperature shut-down, over voltage protection, enable pin, and low noise performance with an low noise option.

Furthermore, it is available in adjustable or fixed output voltages in TO-252-5L, TO-220F-4SL packages.

Application

◈ Consumer and personal electronics

◈ SMPS post-regulator / dc-to-dc modules

◈ High-efficiency linear power supplies

Features and Benefits

◈ Low Dropout Voltage for 1.0A Output : [Max. 500mV]

◈ Built in Thermal shut down circuit

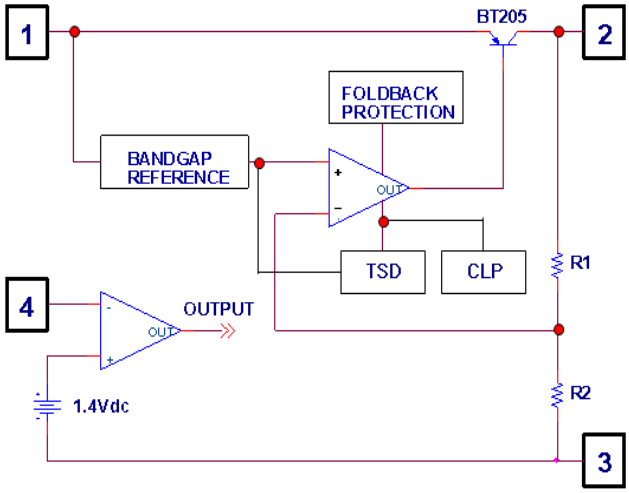
◈ Built in OVP, CLP circuit

◈ Low Quiescent Current

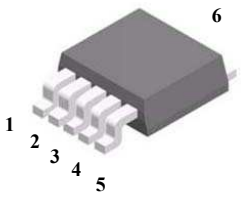
◈ Ultra High level of ESD [Built in ESD Protection Cell]

MM : 400V ↑ / HBM 4KV ↑

Equivalent Circuit

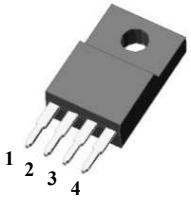


◈ Pin Configuration



TO-252-5L

1: V_{IN}
2: GND
3: V_{OUT}
4: V_{CTL}
5: NC
6: V_{OUT}



TO-220F-4SL

1: V_{IN}
2: V_{OUT}
3: GND
4: V_{CTL}

◈ Product Line-up

Product Name	V_{OUT}	Junction Operating Temperature	Package
SN78R33D	3.3V	-40~150℃	TO-252-5L
SN78R35D	3.5V	-40~150℃	TO-252-5L
SN78R05D	5.0V	-40~150℃	TO-252-5L
SN78R06D	6.0V	-40~150℃	TO-252-5L
SN78R08D	8.0V	-40~150℃	TO-252-5L
SN78R09D	9.0V	-40~150℃	TO-252-5L
SN78R12D	12V	-40~150℃	TO-252-5L
SN78R15D	15V	-40~150℃	TO-252-5L
SN78R33PIC	3.3V	-40~150℃	TO-220F-4SL
SN78R35PIC	3.5V	-40~150℃	TO-220F-4SL
SN78R05PIC	5.0V	-40~150℃	TO-220F-4SL
SN78R06PIC	6.0V	-40~150℃	TO-220F-4SL
SN78R08PIC	8.0V	-40~150℃	TO-220F-4SL
SN78R09PIC	9.0V	-40~150℃	TO-220F-4SL
SN78R12PIC	12V	-40~150℃	TO-220F-4SL
SN78R15PIC	15V	-40~150℃	TO-220F-4SL

◈ Absolute Maximum Ratings (Ta = 25℃)

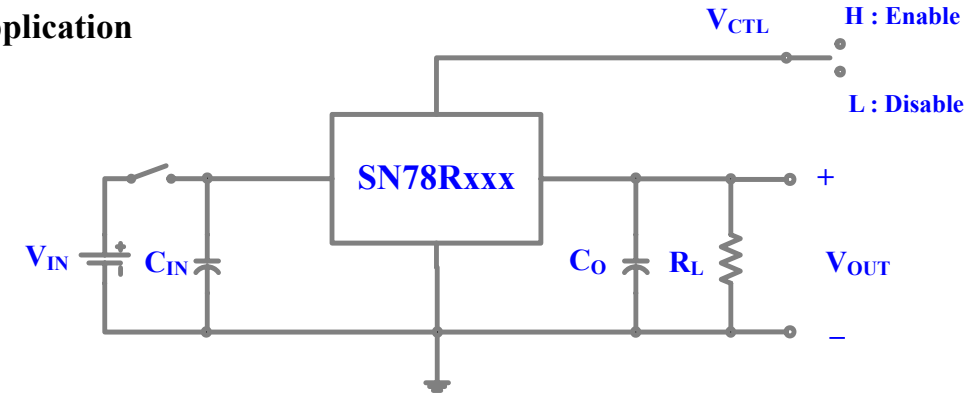
Parameter		Symbol	Limits		Unit
Input Voltage		V_{IN}	35.0		V
Power Dissipation	TO-220F-4SL	P_D	1.5(Note1)	15(Note2)	W
	TO-252-5L		1.3(Note1)	2.7(Note2)	
Junction Temperature		T_J	150		℃
Operate Junction Temperature		T_{opr}	-40 ~ +150		℃
Storage Temperature Range		T_{stg}	-55 ~ +150		℃

Note 1 : No Heat-sink

Note 2 : Infinite Heat-sink(TO-220F) / FR-4 PCB (25.4*25.4mm) for SMD PKG

Absolute maximum ratings indicate limits beyond which damage to the component may occur. Electrical specifications do not apply when operating the device outside of its operating ratings. The maximum allowable power dissipation is a function of the maximum junction temperature, $T_{J(max)}$, the junction-to-ambient thermal resistance, θ_{JA}, and the ambient temperature, T_A.
The maximum allowable power dissipation at any ambient temperature is calculated using:
$P_{D(max)} = (T_{J(max)} - T_A) \div \theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown.

Typical Application



1) C_{IN} should be required if regulators are located far from power supply filter
2) C_O improves output stability and transient response ($C_O \geq 47uF$)

◈ Electrical characteristics

(Vin=(Note 1), Io = 0.5A, $V_{CT(High)}$=2.7V, T_a = 25°C, unless otherwise specified)

Electric Characteristic	Symbol	Conditions		Min.	Typ.	Max.	Unit
Output Voltage	V_O	SN78R33	-	3.22	3.3	3.38	V
		SN78R35	-	3.41	3.5	3.59	V
		SN78R05	-	4.88	5.0	5.12	V
		SN78R06	-	5.85	6.0	6.15	V
		SN78R08	-	7.80	8.0	8.20	V
		SN78R09	-	8.78	9.0	9.22	V
		SN78R12	-	11.70	12.0	12.30	V
		SN78R15	-	14.60	15.0	15.40	V
Line Regulation	$\triangle V_{O(\triangle VI)}$	(Note2)		-	0.5	2.5	%
Load Regulation	$\triangle V_{O(\triangle IL)}$	5mA≤I_O≤1.0A		-	0.1	2.0	%
Quiescent Current	I_{QC}	I_O=0mA		-	-	10	mA
Ripple Rejection Ratio	RR	I_O=50mA, f=120Hz		45	55	-	dB
Dropout Voltage	V_{DROP}	I_O=0.5A		-	-	0.3	V
		I_O=1.0A		-	-	0.5	V
Control Voltage High	$V_{CT(High)}$	I_O=0mA, Output ON		2.0	-	-	V
Control Voltage Low	$V_{CT(Low)}$	I_O=0mA, Output OFF		-	-	0.8	V
Control Bias Current High	$I_{CT(High)}$	$V_{CT(High)}$ = 2.7V		-	-	20	μA
Control Bias Current Low	$I_{CT(Low)}$	$V_{CT(Low)}$ = 0.4V		-	-	-0.4	mA

Note 1)

SN78R33: V_I=5.3V SN78R35: V_I=5.5V

SN78R05: V_I=7.0V SN78R06: V_I=8.0V

SN78R08: V_I=10V SN78R09: V_I=15V

SN78R12: V_I=18V SN78R15: V_I=21V

Note 2)

SN78R33: V_I=4.3V~12V SN78R35: V_I=4.5V~12V

SN78R05: V_I=6V~12V SN78R06: V_I=7V~15V

SN78R08: V_I=9V~25V SN78R09: V_I=10V~25V

SN78R12: V_I=13V~29V SN78R15: V_I=16V~32V

Electrical Characteristic Curves

Fig.1 I_O vs. V_O

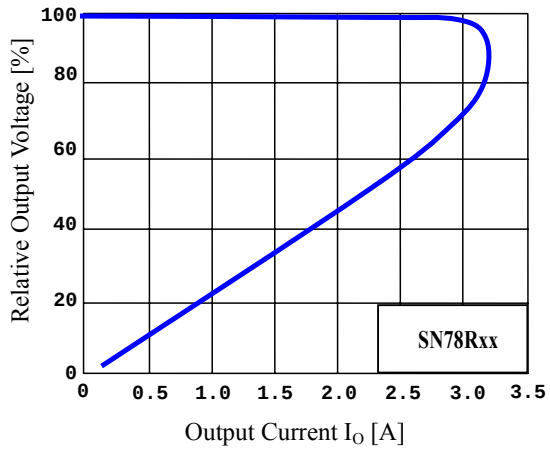


Fig.2 T_a vs. P_D

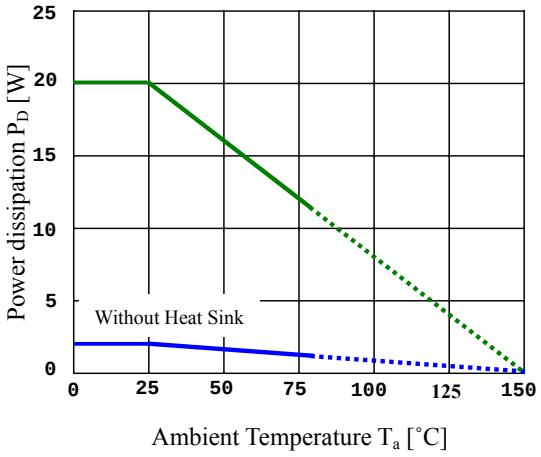


Fig.3 V_I vs. I_{QC}

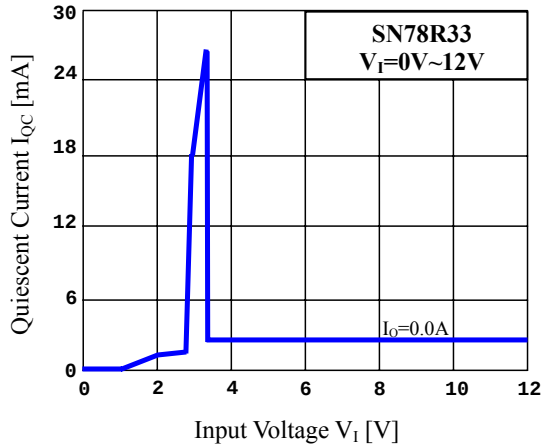


Fig.4 V_I vs. I_{QC}

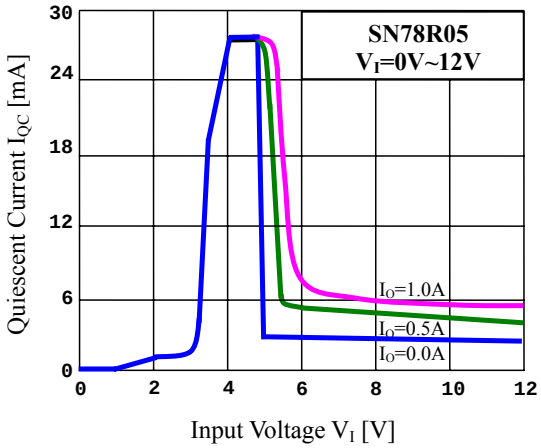


Fig.5 V_I vs. I_{QC}

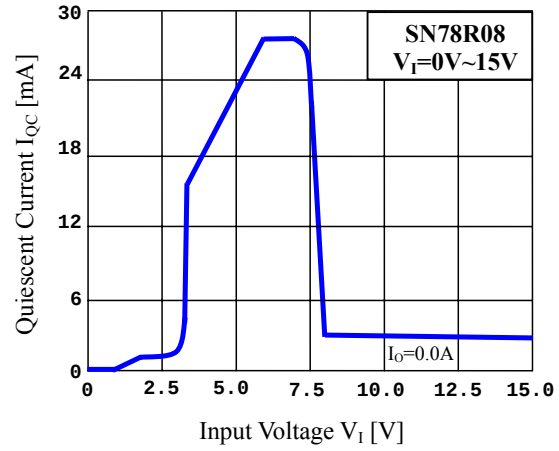
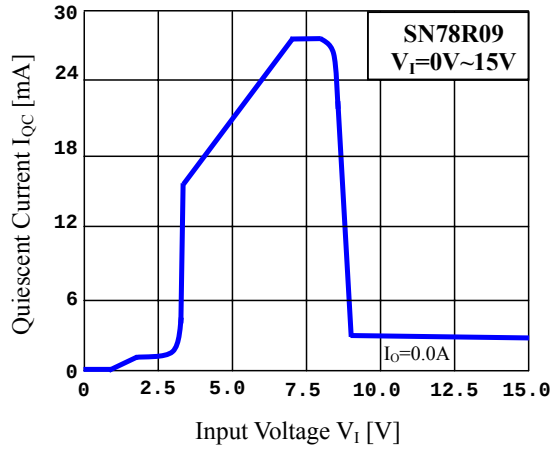


Fig.6 V_I vs. I_{QC}



Electrical Characteristic Curves

Fig.7 V_I vs. I_{QC}

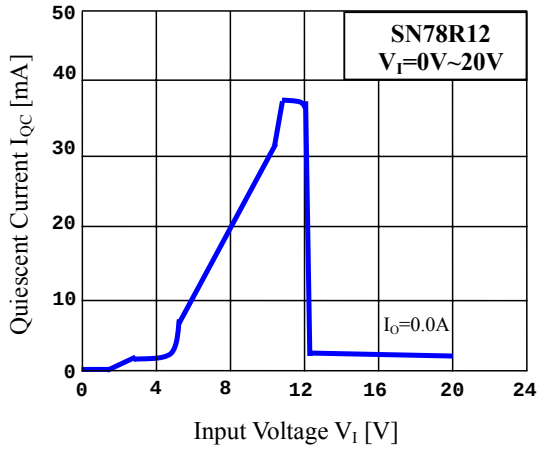


Fig.8 V_I vs. I_{QC}

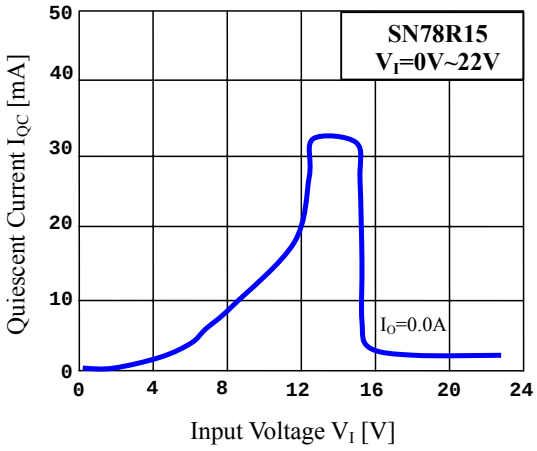


Fig.9 V_{CT} vs. V_O

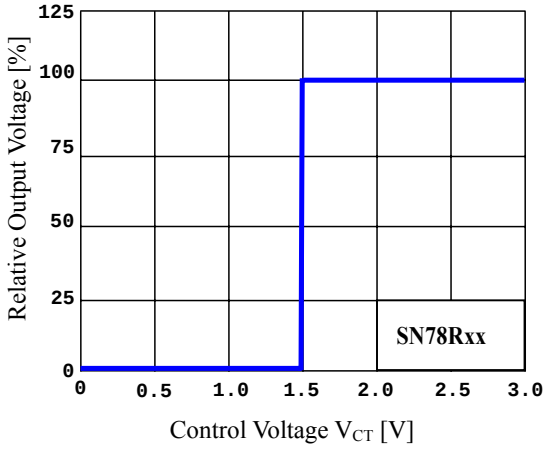


Fig.10 T_j vs. V_O

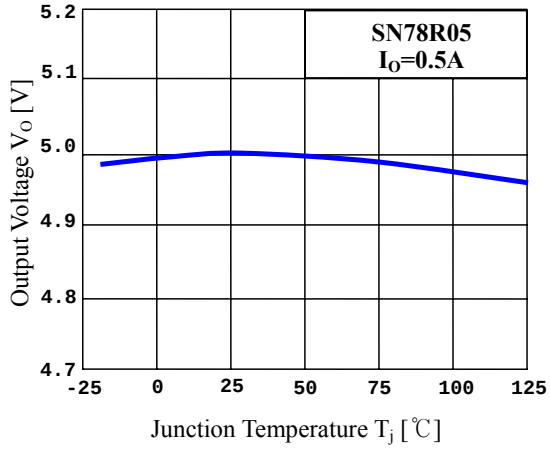
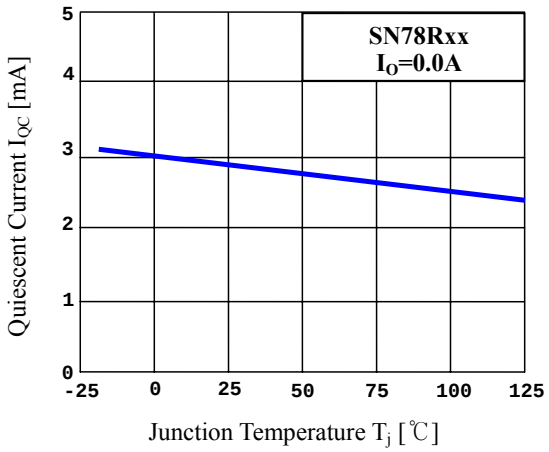
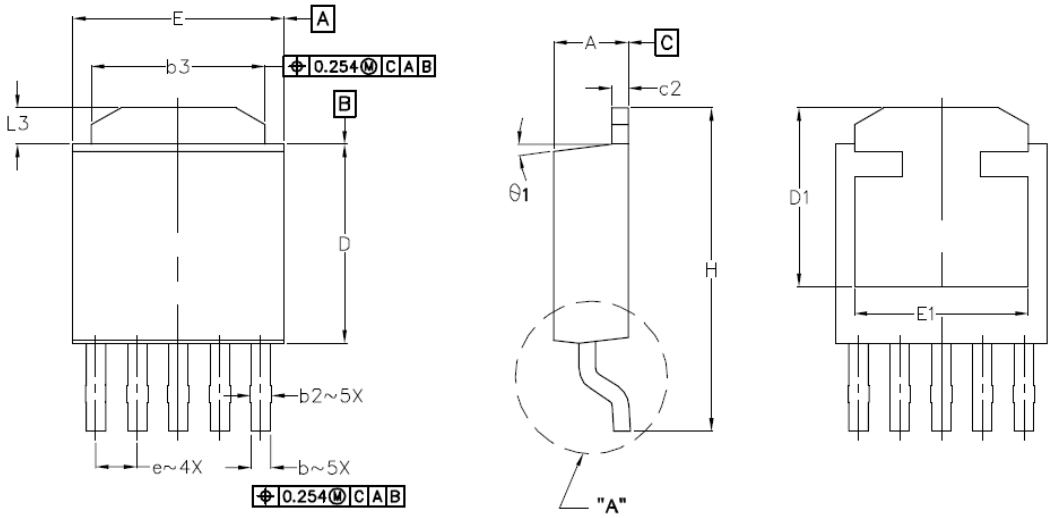
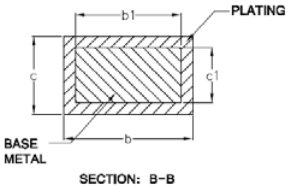


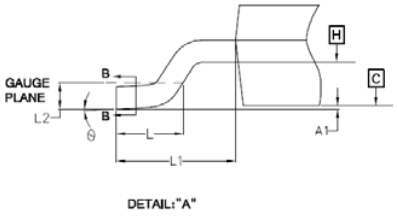
Fig.11 T_j vs. I_{QC}



◈ TO-252-5L Outline Dimension (Unit : mm)

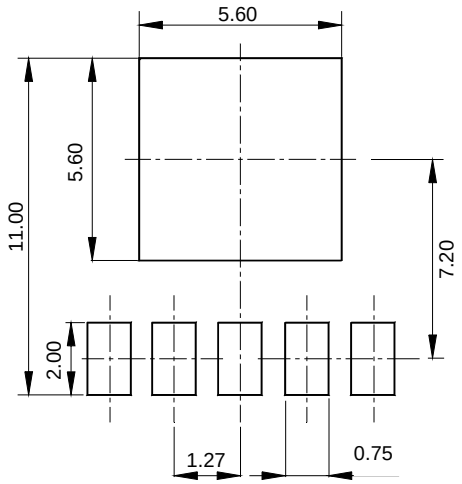




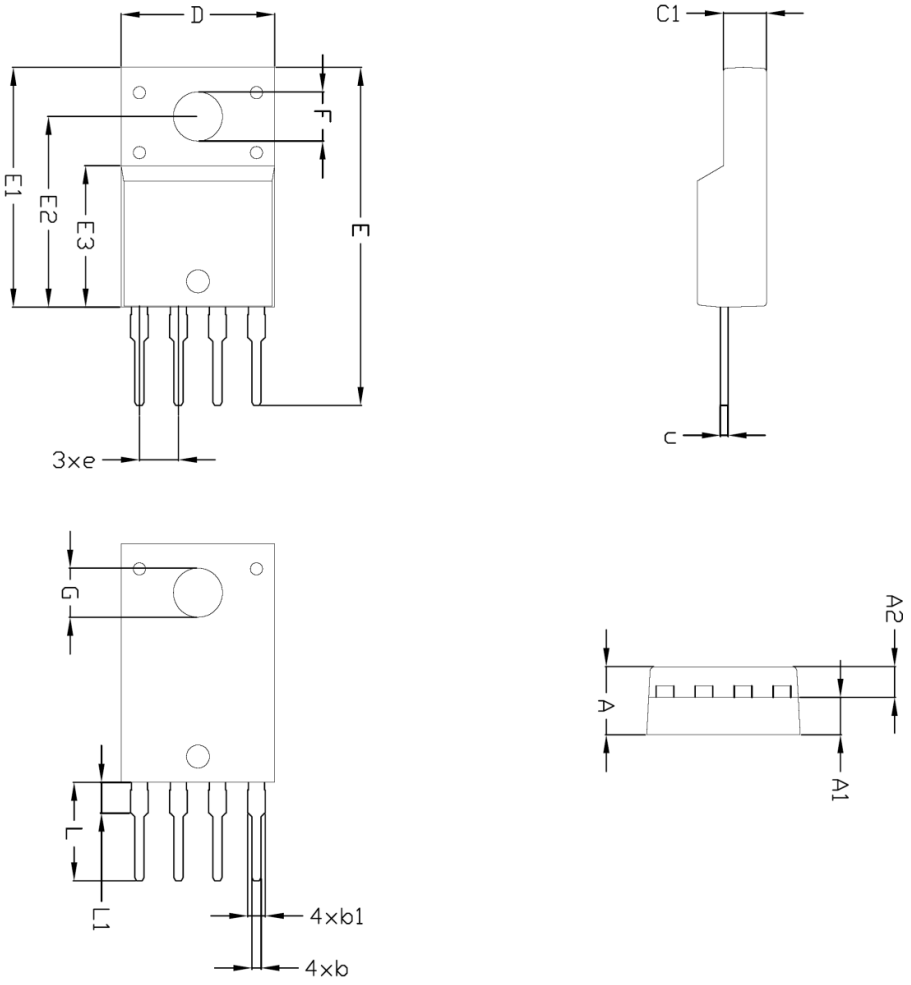


SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	2.184	2.286	2.387	
A1	—	—	0.127	
b	0.508	0.610	0.711	
b1	0.508	0.584	0.660	
b2	0.610	0.699	0.787	
b3	4.953	5.207	5.461	
c	0.460	0.535	0.610	
c1	0.410	0.485	0.559	
c2	0.460	0.675	0.889	
D	5.969	6.096	6.223	
D1	5.207	—	—	
E	6.350	6.541	6.731	
E1	4.318	—	—	
e	1.270 BSC			
H	9.398	9.906	10.414	
L	1.397	1.588	1.778	
L1	2.743 BSC			
L2	0.508 BSC			
L3	0.889	1.080	1.270	
θ	0°	5°	10°	
θ1	0°	7.5°	15°	

※ Recommend PCB solder land [Unit : mm]



◈ TO-220F-4SL Outline Dimension (Unit : mm)



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	-	-	4.60	
A1	2.45	2.50	2.55	
A2	1.95	2.00	2.05	
b	0.50	0.60	0.70	
b1	0.85	1.05	1.25	
c	0.40	0.50	0.60	
c1	2.70	2.80	2.90	
D	9.90	10.00	10.10	
E	20.80	-	21.40	
E1	15.50	15.60	15.70	
E2	12.30	12.40	12.50	
E3	9.15	9.20	9.25	
F	3.10	3.20	3.30	
G	3.30	3.40	3.50	
e	2.54 BSC			
L	5.20	-	5.80	
L1	2.00 BSC			

The AUK Corp. products are intended for the use as components in general electronic equipment (Office and communication equipment, measuring equipment, home appliance, etc.).

Please make sure that you consult with us before you use these AUK Corp. products in equipments which require high quality and / or reliability, and in equipments which could have major impact to the welfare of human life(atomic energy control, airplane, spaceship, transportation, combustion control, all types of safety device, etc.). AUK Corp. cannot accept liability to any damage which may occur in case these AUK Corp. products were used in the mentioned equipments without prior consultation with AUK Corp..

Specifications mentioned in this publication are subject to change without notice.